(12) UK Patent Application (19) GB (11) 2 395 331 (13) A

(43) Date of A Publication 19.05.2004

(21) Application No: 0226262.4

(22) Date of Filing: 11.11.2002

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(51) INT CL[7]:
B60R 25/00 , E05B 49/00 , G07C 9/00

(52) UK CL (Edition W):
G4H HTG H14A H2L H2P H2V
U1S S1792 S1821 S2188 S2189

(56) Documents Cited:
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(58) Field of Search:
UK CL (Edition V) **G4H**
INT CL[7] **B60R, G08B**
Other: **Online: WPI, EPODOC, PAJ**

(54) Abstract Title: **Controlling the operation of a vehicle in accordance with the user's location**

(57) A control system for a vehicle 102, especially a delivery vehicle, which detects the location of a user of the vehicle and controls the operation of the vehicle in accordance with the user's location. The control system comprises a tag 104a, 104b which may be carried by a user of the vehicle, e.g. a driver/assistant. A tag detector 106 comprises a plurality of transceiver units 108 disposed about the vehicle. When in range of one or more of the transceiver units, each of the tags emits a characteristic signature signal 152. Characteristics of the signature signal (i.e. amplitude, frequency and phase) are passed to a control unit 110 which generates a location signal indicative of the location of the detected tag. Operation of the vehicle, e.g. actuation of door locks, a load hatch lock, a handbrake lock, and ignition lock, and/or a warning system, is controlled in accordance with the location signal, possibly in addition to signals from other vehicle transducers, eg. a seat pressure pad.

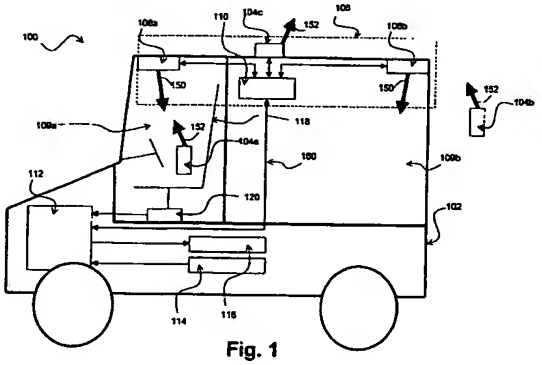

Fig. 1

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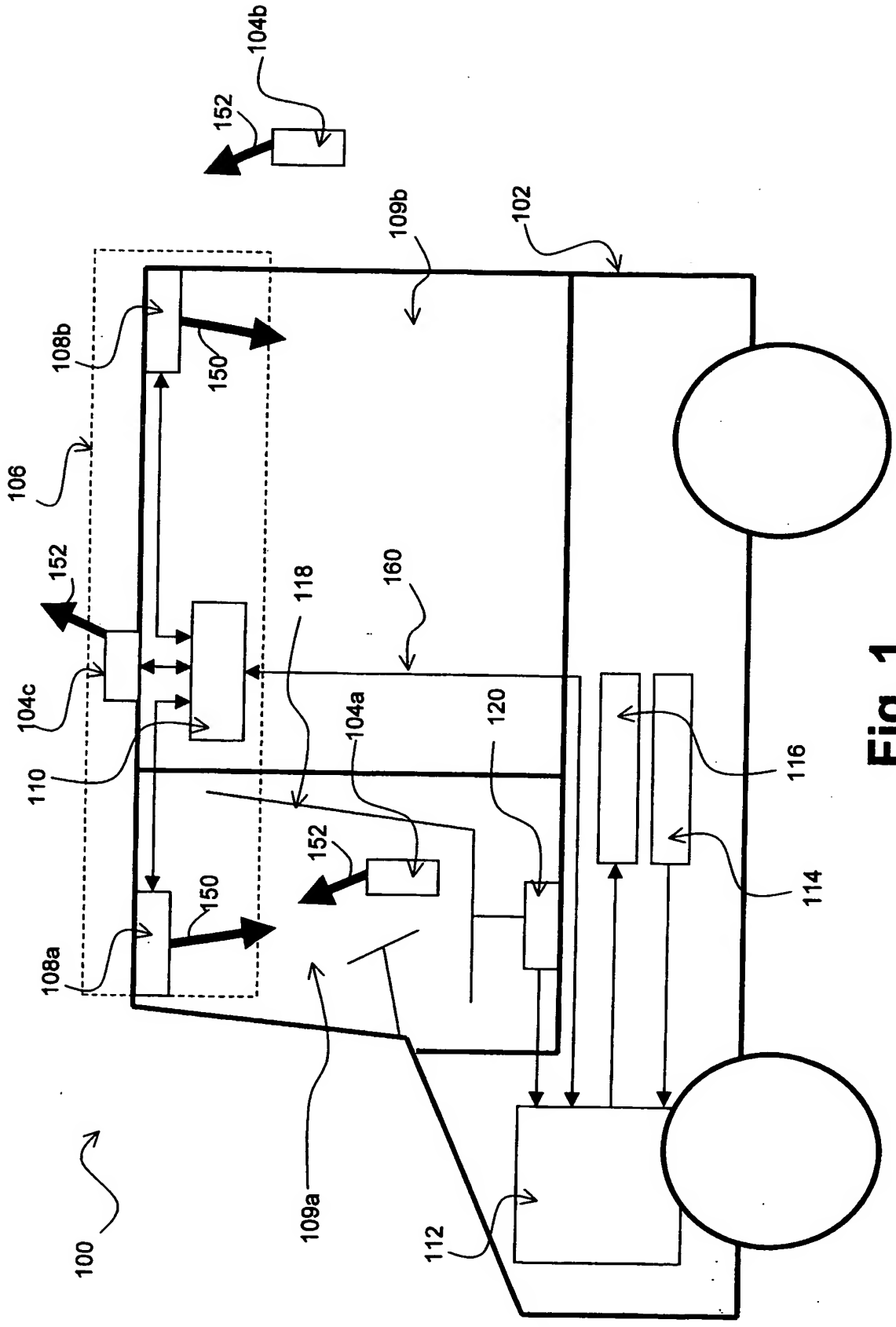
104b
152
109b
102
108b
150
106
152
118
160
104c
104a
120
110
116
152
150
114
108a
109a
112
100

Fig. 1

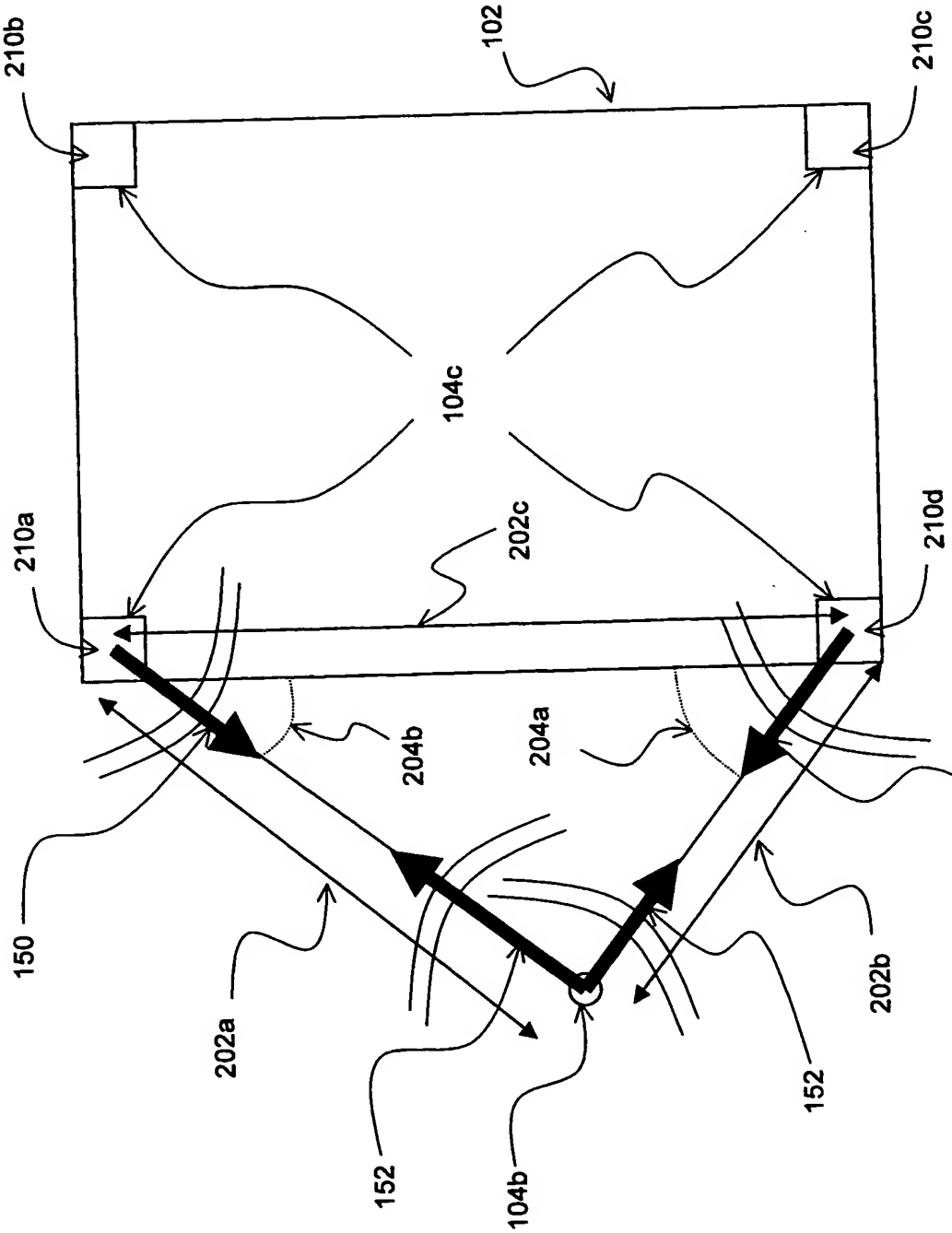
210b
102
210c
104c
210a
202c
210d
204b
204a
150
150
202a
202b
152
152
104b

Fig. 2

SAFETY AND SECURITY SYSTEM FOR DELIVERY VEHICLES

FIELD OF THE INVENTION

The present invention relates to a control system for a vehicle which detects the location of a user of the vehicle and controls the operation of the vehicle in accordance with the user's location. In particular, the present invention relates to a safety and security system for delivery vehicles which can warn the delivery vehicle operator and control the vehicle depending on the location of the operator.

BACKGROUND OF THE INVENTION

Recent growth in the demand for consumer goods has increased the demand for delivery vehicles. In particular, the growth of the Internet and telephone sales has increased the demand for point-to-point delivery of goods. One example is home grocery shopping via the Internet where customers place orders for purchases using the Internet. The purchases are then delivered directly to homes at a specified times using delivery vehicles. Such an increase in demand for quick delivery of goods at convenient delivery times has placed a huge burden on operators and/or drivers of delivery vehicles.

Delivery vehicles are often required to make frequent stops to pickup or deliver goods. Currently, these stops necessitate the driver or operator of the vehicle (there may be an assistant who does not carry out driving duties) performing one or more of the following tasks: exiting the driver compartment; sorting, selecting or preparing goods in the load compartment; moving away from the vehicle; delivering or picking-up goods; returning to the vehicle; re-sorting the contents of the load compartment; doing paperwork or administrative duties; communicating by radio or telephone with a depot or dispatcher; and/or planning the route to subsequent stops. Thus, there is a substantial burden placed on the operator and/or driver of the delivery vehicle, particularly if there is only a single operator who both drives the vehicle and delivers goods to their destination. As a result of this substantial burden, it is all too easy for the driver and/or operator to ignore certain safety and/or security procedures relating to the delivery vehicle and its contents.

There are a number of situations which may arise which may jeopardise the safety of the driver, operator, other road users and/or pedestrians. Specifically, the vehicle can be stolen and driven away whilst the driver or operator is away from the driver compartment. A stolen vehicle is likely to be driven by a person who is unfamiliar with the vehicle and may be driven at unsafe speeds and is therefore more likely to be involved in a road accident. In addition, children may access the driver compartment and release the handbrake or drive the vehicle away, particularly in open-sided "milk float" type vehicles. Furthermore, the driver may inadvertently forget to apply the handbrake before leaving the driver compartment which might allow the delivery vehicle to move whilst goods are being delivered to their destination, thereby putting the driver, operator, other road users and/or pedestrians at risk. The driver or operator might accidentally release the handbrake whilst moving themselves or objects inside the driver compartment. Another un-safe situation could arise if under-age or unlicensed operators are employed with a driver in the delivery of goods. The under-age or unlicensed operators might operate the vehicle contrary to safety regulations, particularly since the vehicle might be away from a depot and the direct control of supervisors. Of course, the vehicle may also be interfered with and made un-safe by third parties, for example through sabotage of equipment under the bonnet, fuel cap or inspection covers. When there is both a driver and a further operator or assistant, who may be working at the rear of the vehicle or inside the load compartment, the vehicle could be driven away inadvertently by the driver causing injury to the operator or assistant.

There are also a number of potential threats to the security of the vehicle and its contents which can arise whilst operational tasks are being carried out. In particular, theft of the vehicle and its contents is possible if the keys are inadvertently left in the vehicle or the load compartment is left unlocked or open. Of course, this is all the more likely when the driver is away from the vehicle delivering goods to their destination. Theft of the contents of the driver compartment, which may include valuable possessions or cash takings from deliveries which have been made and stored in a safety deposit box, is also more likely when the driver is away from the vehicle.

In current systems and methods, the safety and security of a delivery vehicle is maintained by enforcing rigorous safety and security procedures on the driver and other operators.

However, the ever-increasing time pressures on delivery operators means that safety and security procedures are often forgotten, neglected or overlooked. The sequence of locking and unlocking doors and hatches at various locations on the vehicle, removing keys from the ignition and applying the handbrake in order to make the vehicle safe and secure at every stop uses up precious time and prevents speedy execution of operational tasks.

Accordingly, it is an object of the present invention to provide a dedicated system and method for improving the safety and/or security of vehicles.

In addition, it is a further object of the present invention to provide a control system for a vehicle which detects the location of a user of the vehicle and controls the operation of the vehicle in accordance with the user's location.

SUMMARY OF THE INVENTION

In accordance with a first aspect of the present invention, there is provided a control system for a vehicle comprising:

a tag carried by a user of the vehicle;

a tag detector generating a first signal indicative of the location of the tag; and

control means for controlling operation of the vehicle in accordance with the first signal.

The vehicle can be controlled automatically by passive and non-invasive detection of the tag without a user having to actively undertake any additional tasks.

Preferably, the control means comprises:

a control unit; and

one or more actuators,

wherein the control unit operates the actuators in accordance with the first signal.

The control unit may be a stand-alone micro-controller, or, alternatively, may be integrated with the vehicle's engine management unit (EMU).

In one embodiment of the present invention, one of the actuators is a driver compartment lock, the detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the driver compartment lock to prevent access to the driver compartment when the first signal indicates that the tag is not in close proximity to the driver compartment.

In another embodiment of the present invention, one of the actuators is a load compartment lock, the detector is configured to determine whether the tag is in close proximity to a load compartment of the vehicle and the control unit operates the load compartment lock to prevent access to the load compartment when the first signal indicates that the tag is not in close proximity to the load compartment.

In yet another embodiment of the present invention, one of the actuators is an ignition lock, the detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the ignition lock to prevent engine ignition when the first signal indicates that the tag is not in close proximity to the driver compartment.

In this way, there is improved security of the vehicle, without a user having to manually lock the vehicle.

In one embodiment of the present invention, one of the actuators is a handbrake lock, the tag detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the handbrake lock to prevent disengagement of a handbrake in the vehicle when the signal indicates that the tag is not in close proximity to the driver compartment.

Thus, there is improved safety in delivery of goods when a user is operating at the rear of the vehicle.

Preferably, the control system comprises a seat detector generating a second signal indicative of the presence of a person sitting in a driver's seat in the vehicle. The control

unit operates the ignition lock in accordance with the second signal, such that engine ignition is possible only when a user of the vehicle carrying the tag is seated in the driver's seat. Moreover, the control unit operates the handbrake lock in accordance with the second signal, such that operation of the handbrake is possible only when a user of the vehicle carrying the tag is seated in the driver's seat.

In one embodiment of the present invention, one of the actuators is a safe-box lock, the tag detector is configured to determine whether the tag is in close proximity to the vehicle and the control unit operates the safe-box lock to prevent access to a safe-box in the vehicle when the first signal indicates that the tag is not in close proximity to the vehicle.

In another embodiment of the present invention, one or more of the actuators are external vehicle compartment locks, the tag detector is configured to determine whether the tag is in close proximity to the vehicle and the control unit operates the external vehicle compartment locks to prevent access to external vehicle compartments of the vehicle when the first signal indicates that the tag is not in close proximity to the vehicle.

Preferably, the control system further comprises an intruder alarm, wherein the alarm is configured to be activated on operation of the vehicle when the first signal indicates that the tag is not proximate to the vehicle.

Additionally, the control system may comprise a warning alarm which may be integrated with the intruder alarm. The warning alarm may comprise any form of audible or visual warning, for example a siren or a flashing light.

The control system may comprise a handbrake detector, wherein the control unit activates the warning alarm when a handbrake of the vehicle is released and the first signal indicates that the tag is located on a user at the rear of the vehicle. Thus, improved safety of the vehicle is provided. Moreover, the control system may comprise a load compartment door detector, wherein the control unit activates the warning alarm when the first signal indicates that the tag is not proximate to the vehicle and that a load compartment hatch is not closed. Thus, improved security of the vehicle is provided.

Preferably, the tag comprises an inductive loop responsive to electromagnetic radiation emitted by the tag detector to generate a signature signal, the signature signal being detected by the tag detector to generate the first signal indicative of the location of the tag.

Alternatively, the tag may comprise an electromagnetic transceiver which generates a signature signal which can be detected by the tag detector.

In one embodiment of the present invention, the tag detector comprises a load compartment transceiver unit configured to detect the tag in a load compartment of the vehicle.

In another embodiment of the present invention, the tag detector comprises a driver compartment transceiver unit configured to detect the tag in a driver compartment of the vehicle.

In yet another embodiment of the present invention, the tag detector comprises:

an external transceiver unit comprising a plurality of individual transceivers, each configured to determine the amplitude of a signal received from the tag when it is external to the vehicle; and

a transceiver control unit configured to determine the location of the tag with respect to the vehicle from the amplitudes.

Thus, the location of a user carrying the tag external to the vehicle can be determined.

In a second aspect of the present invention, there is provided a vehicle comprising the control system as described above. The vehicle may be a delivery vehicle.

In a third aspect of the present invention, there is provided a method of controlling the operation of a vehicle comprising the steps of:

detecting the location of a tag carried by a user of the vehicle;

generating a signal indicative of the location of the tag; and

controlling operation of the vehicle in accordance with the signal.

BRIEF DESCRIPTION OF DRAWINGS

A specific embodiment is now described by way of example only and with reference to the accompanying drawings, in which:

Fig. 1 shows a representation of the control system according to a preferred embodiment of the present invention; and

Fig. 2 shows the layout of an external tag transceiver unit according to a preferred embodiment of the present invention.

DETAILED DESCRIPTION OF DRAWINGS

The present invention is described below relative to a preferred embodiment. Those skilled in the art will realise that the present invention may be implemented in a number of different embodiments and is not specifically limited to the particular embodiment depicted herein. In particular, the preferred embodiment of a control system is described with reference to a delivery vehicle. However, it will be appreciated that the control system may be implemented in any type of vehicle and not limited merely to delivery vehicles.

Referring to Fig. 1, there is provided a control system (100) for a delivery vehicle (102) having a driver compartment (109a) at the front of the delivery vehicle (102) and a load compartment (109b) at the rear of the vehicle (102). The load compartment (109b) and the driver compartment (109a) have at least a driver door (not shown) and a load hatch (not shown). A first tag (104a) is carried by a driver (not shown) of the vehicle (102) and second tag (104b) is carried by another operator of the vehicle (102), such as an assistant (not shown). In the preferred embodiment, each of the tags (104a, 104b) comprises an inductive coil and other circuitry which are responsive to electromagnetic radiation (150) and emit a signature signal (152) which is specific to each of the tags (104a, 104b).

A tag detector (106) comprises a driver compartment transceiver unit (108a), a load compartment transceiver unit (108b), an external transceiver unit (108c) and a transceiver control unit (110). Each of the transceiver units (108a, 108b, 108c) is bi-directionally connected to the transceiver control unit (110) and emits electromagnetic radiation (150), the intensity and frequency of which is controlled by the transceiver control unit (110). As mentioned above, when in range of one or more of the transceiver units (108a, 108b, 108c), each of the tags (104a, 104b) will emit a signature signal (152) characterising a particular tag (104a, 104b). A given signature signal (152) is received by one or more of the transceiver units (108a, 108b, 108c). Signal characteristics of the signature signal (152) (i.e. the amplitude, frequency and phase of the signature signal) are passed to the transceiver control unit (110) which interprets the signal characteristics and generates a

location signal (160) for each of the detected tags (104a, 104b). The location signal is indicative of the location of the detected tag (104a, 104b).

The transceiver control unit (110) detects the presence of one of the tags (140a, 104b) in the driver compartment (109a) by determining if the amplitude of the signature signal (152) received at the load compartment transceiver unit (108b) is above a given threshold. In a similar manner, the transceiver control unit (110) detects the presence of one of the tags in the load compartment (109b) by determining if the amplitude of the signature signal (152) received at the load compartment transceiver unit (108b) is above a given threshold. Furthermore, the transceiver control unit (110) can determine the presence and location of a tag (104b) outside the delivery vehicle (102) by interpreting a combination of the amplitude and phase of the signature signal (152) received from the tag (104b) at a plurality of individual transceivers in the external transceiver unit (108c) (see below). The external location of the tag (104b) is determined as an angle with respect to the front-rear axis of the delivery vehicle (102).

In a preferred embodiment of invention, the location signal (160) for each tag (104a, 104b) generated by the transceiver control unit (110) comprises a 32-bit word as shown in Table 1 below:

Table 1: Location signal

Bits 1 to 24 (24 bits)	Bits 25 and 26 (2 bits)	Bits 27 to 32 (6 bits)
Tag identifier	Location	Heading (if external to vehicle (102))
0 to 16,777,215	0 – not detected 1 – in driver compartment (109a) 2 – in load compartment (109b) 3 – external to vehicle (102)	Angle relative to front-rear axis of vehicle (102) (5.625 degree resolution)

A control unit (112) polls the transceiver control unit (110) for tags that have been pre-registered with the control unit (112) by passing a tag identifier (see above) for each pre-registered tag (104a, 104b) to the transceiver control unit (110). The transceiver control

unit (110) returns the location signal (160) (see Table 1) for each tag (104a, 104b) with which it is polled. Each tag (104a, 104b) has a unique tag identifier which is 24 bits wide resulting in a possible 16,777,216 tag identifiers. The transmission of the signature signal (152) from each tag (104a, 104b) to the transceiver units (108a, 108b, 108c) carries the tag identifier in an encrypted form. The tag identifier is decrypted by the transceiver control unit (110) so that it can be passed to the control unit (112) when polled. The encryption of the tag identifier prevents third parties picking up the signature signal and determining the tag identifier which would allow them to produce a duplicate tag for accessing the control system (100).

Registration of a tag (104a, 104b) with the control system (100) allows the control unit (112) to identify the tag (104a, 104b), so that it can poll the transceiver control unit (110) for that tag (104a, 104b) and also enables encryption codes to be transferred to the transceiver control unit (110) from the tag (104a, 104b). In the preferred embodiment, a tag (104a, 104b) which is to be registered with the control unit (112) is positioned in the driver compartment (109a) and a separate radio transmitter, unique to the control unit (112), is used to signal to the control unit (112) via the driver compartment transceiver unit (108a) and transceiver control unit (110) that registration of the tag (104a, 104b) should commence. This way, an encryption code and tag identifier can be read from the tag (104a, 104b) into the transceiver control unit (110) and control unit (112) respectively via the driver compartment transceiver unit (108a).

The control unit (112) receives the location signal (160) from the transceiver control unit (110) and other signals from a seat pressure pad (120) and other vehicle transducers (114). Other vehicle transducers (114) may include door lock sensors for the driver compartment (109a) and the load compartment (109b) and a handbrake activation sensor. The seat pressure pad (120) detects when someone is sitting in the driver's seat (118). By processing the signals received from the other vehicle transducers (114), the seat pressure pad (120) and the location signal (160), the control unit (112) can detect unsafe and insecure situations and activate appropriate actuators (116). The actuators (116) may include driver compartment door locks (not shown), a load hatch lock (not shown), a handbrake lock (not shown), an ignition lock (not shown) and/or a warning system (not shown).

The presence of an unauthorised operator sitting in the driver's seat (118) can be detected if the pressure pad (120) indicates that someone is sitting in the driver's seat (118), but no location signal (160) indicating the presence of the first tag (104a) (carried by an authorised driver of the vehicle (102)) is received from the driver compartment transceiver unit (108a) via the transceiver control unit (110). The presence of an authorised operator sitting in the driver's seat (118) can be detected if the pressure pad (120) indicates that someone is sitting in the driver's seat (118) and a location signal (160) indicating the presence of the first tag (104a) (carried by an authorised driver of the vehicle (102)) is received from the driver compartment transceiver unit (108a) via the transceiver control unit (110).

As an example of the operation of the preferred embodiment, the following is a description of a typical delivery made using a delivery vehicle (102) incorporating the aforementioned control system (100).

The delivery vehicle (102) leaves a depot with goods in the load compartment (109b) and with a driver carrying the first tag (104a) and an assistant carrying the second tag (104b). The assistant is not qualified to drive the delivery vehicle (102).

At a first destination, the assistant alights the delivery vehicle (102) and walks to the load hatch at the rear of the vehicle (102) out of the driver's view. The control unit (112) determines the location of the assistant from the second tag (104b) via the external tag detector and notifies the driver that the assistant is at the rear of the vehicle (102). This way, if the driver has not applied the handbrake, he would be instructed to do so by a warning system under control from the control unit (112). The warning system may issue any form of visual or audible warning. If, however, the control unit (112) detects that the driver is not in the driver compartment (109a), then the handbrake may be actuated automatically by a handbrake actuator under control from the control unit (112). A handbrake lock remains active, preventing the release of the handbrake, until it is detected that the driver has returned to the driver compartment (109a) and the assistant is not at the rear of the delivery vehicle (102).

When it is determined that the assistant is near the load hatch, the control unit (112) deactivates the load hatch lock so that goods in the load compartment (109b) can be accessed by the assistant who removes them for delivery. If the load hatch is left open when the control unit (112) detects, via the external transceiver unit (108c), that the assistant has moved away from the vehicle (102), the warning system will warn the driver and/or assistant that the load hatch is still open. As soon as the control unit (112) detects that the assistant has moved away from the rear of the vehicle (102) and the load hatch has been shut, the load hatch is locked by the load hatch lock under control from the control unit (112).

At a second destination, both the driver and assistant alight from the delivery vehicle (102) to make several deliveries. The control unit (112) detects via the driver compartment transceiver unit (108a) that the driver is no longer in the driver compartment (109a) and warns the driver if the handbrake is not applied. If no action is taken to rectify this situation, the control unit (112) automatically applies the handbrake via the handbrake actuator. The ignition lock is automatically activated by the control unit (112) when the driver is away from the driver compartment (109a) and is unlocked on the driver's return.

The control unit (112) detects that the driver and the assistant are both away from the driver compartment (109a) and activates the driver compartment door locks accordingly. In the event that a driver compartment door is left open, the warning system warns the driver and/or assistant of this.

In the event that a warning of an open door is not heard by the driver and/or assistant and an unauthorised person accesses the driver compartment (109a), they will be unable to operate the vehicle (102) as the handbrake and ignition locks will have been applied by the control unit (112). Moreover, the control unit (112) can distinguish between the first tag (104a), carried by the driver, and the second tag (104b), carried by the assistant, so that ignition and handbrake locks remain activated if the assistant (carrying the second tag (104b)) is in the driver's seat, thereby preventing operation of the vehicle (102) by the assistant who is not qualified to drive the vehicle (102).

If an unauthorised person (see above) sits in the driver's seat (118), the warning system sounds an intrusion alarm, similar to conventional vehicle intrusion alarms.

In addition, a safety deposit box for cash takings and other valuables may be locked by the control unit (112) whenever both the driver and the assistant are away from the driver compartment (109a), as detected by the control unit (112).

If the control unit (112) detects via the load compartment transceiver unit (108a) that the assistant is in the load compartment (109b), then the handbrake and/or ignition lock will be actuated by the control unit (112) until the assistant has left the load compartment (109b), thereby preventing the vehicle (102) being driven away with the assistant in the load compartment (109b).

A third tag (not shown) can be kept by a customer to whom goods are being delivered. The control unit (112) can be configured at the depot to unlock the load hatch only when the third tag is detected near the load hatch. Thus, improved security can be provided for certain customers (e.g. banks) who require their own supervision of good delivery at a destination.

On return to the depot, a separate radio transceiver can signal to the control unit (112) via the driver compartment transceiver unit to deactivate the control system (100), so that the vehicle (102) can be cleaned, serviced and reloaded. In fact, the radio transceiver is operable to configure the operation of the entire control unit (112) (e.g. registration of tags with the control unit (112), which tags cause the doors to be locked and unlocked etc.).

The registration of different tags with different delivery vehicles allows only certain drivers to drive certain vehicles, thereby preventing the wrong vehicles being driven away from the depot and/or applying a speed limit to new drivers via speed limiters connected to the control unit (112).

Referring to Fig. 2, one embodiment of the external transceiver unit (104c) having individual transceivers (210a, 210b, 210c and 210d) located on the corners of the roof of the vehicle (102) is shown. The individual transceivers (210a, 210b, 210c and 210d)

transmit electromagnetic radiation (150) which is picked up by a tag (104b) external to the vehicle (102). An inductive coil in the tag (104b), which resonates at the frequency of the transmitted electromagnetic radiation (150), causes electromagnetic radiation (152) to be reflected back towards the individual transceivers in the form of a signature signal (152). The amplitude of the reflected electromagnetic radiation (152) is measured at each of the individual transceivers (210a, 210d) and interpreted by the transceiver control unit (110) according to an inverse square relationship to give an approximate distance from the individual transceivers (210a, 210d) to the tag (104b). A location for the tag (104b) is given by consideration of an angle, A (204a), which is given by the following expression:

$$A = \cos^{-1}(b^2 + c^2 - a^2) / (2bc)$$

where a and b are distances (202a, 202b) calculated from consideration of the amplitude of reflected electromagnetic radiation (152) and c is a known distance (202c).

It will of course be understood that the present invention has been described above purely by way of example and modifications of detail can be made within the scope of the invention.

CLAIMS

1. A control system for a vehicle comprising:

a tag carried by a user of the vehicle;

a tag detector generating a first signal indicative of the location of the tag; and

control means for controlling operation of the vehicle in accordance with the first signal.

2. A control system for a vehicle according to claim 1, wherein the control means comprises:

a control unit; and

one or more actuators,

wherein the control unit operates the actuators in accordance with the first signal.

3. A control system for a vehicle according to claim 2, wherein one of the actuators is a driver compartment lock, the detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the driver compartment lock to prevent access to the driver compartment when the first signal indicates that the tag is not in close proximity to the driver compartment.

4. A control system for a vehicle according to claim 2 or claim 3, wherein one of the actuators is a load compartment lock, the detector is configured to determine whether the tag is in close proximity to a load compartment of the vehicle and the control unit operates the load compartment lock to prevent access to the load compartment when the first signal indicates that the tag is not in close proximity to the load compartment.

5. A control system for a vehicle according to any one of claims 2 to 4, wherein one of the actuators is an ignition lock, the detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the ignition lock to prevent engine ignition when the first signal indicates that the tag is not in close proximity to the driver compartment.

6. A control system for a vehicle according to any one of claims 2 to 5, wherein one of the actuators is a handbrake lock, the tag detector is configured to determine whether the tag is in close proximity to a driver compartment of the vehicle and the control unit operates the handbrake lock to prevent disengagement of a handbrake in the vehicle when the signal indicates that the tag is not in close proximity to the driver compartment.

7. A control system for a vehicle according to any one of the preceding claims, further comprising a seat detector generating a second signal indicative of the presence of a person sitting in a driver's seat in the vehicle.

8. A control system according to claim 7 when dependant on claim 5, wherein the control unit further operates the ignition lock in accordance with the second signal, such that engine ignition is possible only when a user of the vehicle carrying the tag is seated in the driver's seat.

9. A control system according to claim 7 when dependant on claim 6, wherein the control unit further operates the handbrake lock in accordance with the second signal, such that operation of the handbrake is possible only when a user of the vehicle carrying the tag is seated in the driver's seat.

10. A control system according to any one of claims 2 to 10, wherein one of the actuators is a safe-box lock, the tag detector is configured to determine whether the tag is in close proximity to the vehicle and the control unit operates the safe-box lock to prevent access to a safe-box in the vehicle when the first signal indicates that the tag is not in close proximity to the vehicle.

11. A control system according to any one of claims 2 to 10, wherein one or more of the actuators are external vehicle compartment locks, the tag detector is configured to determine whether the tag is in close proximity to the vehicle and the control unit operates the external vehicle compartment locks to prevent access to external vehicle compartments of the vehicle when the first signal indicates that the tag is not in close proximity to the vehicle.

12. A control system according to any one of claims 1 to 11, further comprising an intruder alarm, wherein the alarm is configured to be activated on operation of the vehicle when the first signal indicates that the tag is not proximate to the vehicle.

13. A control system according to any one of claims 1 to 12, further comprising a warning alarm.

14. A control system according to claim 13, further comprising a handbrake detector, wherein the control unit activates the warning alarm when a handbrake of the vehicle is released and the first signal indicates that the tag is located on a user at the rear of the vehicle.

15. A control system according to claim 13 or 14, further comprising a load compartment door detector, wherein the control unit activates the warning alarm when the first signal indicates that the tag is not proximate to the vehicle and that a load compartment hatch is not closed.

16. A control system according to any one of the preceding claims, wherein the tag comprises an inductive loop responsive to electromagnetic radiation emitted by the tag detector to generate a signature signal, the signature signal being detected by the tag detector to generate the first signal indicative of the location of the tag.

17. A control system according to any one of claims 1 to 15, wherein the tag comprises an electromagnetic transceiver which generates a signature signal which can be detected by the tag detector.

18. A control system according any one of the preceding claims, wherein the tag detector comprises a load compartment transceiver unit configured to detect the tag in a load compartment of the vehicle.

19. A control system according any one of the preceding claims, wherein the tag detector comprises a driver compartment transceiver unit configured to detect the tag in a driver compartment of the vehicle.

20. A control system according any one of the preceding claims, wherein the tag detector comprises:

an external transceiver unit comprising a plurality of individual transceivers, each configured to determine the amplitude of a signal received from the tag when it is external to the vehicle; and

a transceiver control unit configured to determine the location of the tag with respect to the vehicle from the amplitudes.

21. A vehicle comprising the control system of any one of the preceding claims.

22. A vehicle according to claim 21, wherein the vehicle is a delivery vehicle.

23. A method of controlling the operation of a vehicle comprising the steps of:

detecting the location of a tag carried by a user of the vehicle;

generating a signal indicative of the location of the tag; and

controlling operation of the vehicle in accordance with the signal.

24. A control system, substantially as hereinbefore described with reference to the accompanying drawings.

25. A vehicle, substantially as hereinbefore described with reference to the accompanying drawings.

26. A method of controlling the operation of a vehicle, substantially as hereinbefore described with reference to the accompanying drawings.

Application No:	GB 0226262.4	**Examiner:**	Melanie Gee
Claims searched:	1-26	**Date of search:**	9 April 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X	1, 2, 3, 5, 16, 20, 21 & 23	GB 2371137 A	(LAND ROVER), see whole document.
X	1, 2, 3, 5, 17, 19, 21 & 23	US 6208239	(MÜLLER et al.), see whole document.
X	1, 2, 16, 19, 21 & 23	EP 0523602 A1	(BAYERISCHE MOTEREN WERKE), see abstract.
X	1, 2, 16, 21 & 23	GB 2331671 A	(SIEMENS), see page 5 line 11- page 6 line 29, and page 19 lines 18 -35.
A		EP 0930032 A1	(MATSUSHITA)

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC[V]:

G4H

Worldwide search of patent documents classified in the following areas of the IPC[7]:

B60R; G08B

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, PAJ